

REMARKS / ARGUMENTS

I. General Remarks

Applicants hereby requests continued examination, in accordance with 37 C.F.R. § 1.114. Applicants respectfully request that the preliminary amendment herein be entered, and further request consideration of the claims in light of the amendments and remarks contained herein.

Claims 1-3, 6, 7, 9, 10, 12, 13, 15, 16, 19-21, 26, 28, 29, 31, 32, 34, and 35 have been amended. Claims 4, 5, 23, 24, and 38-49 have been cancelled. Claims 50-53 have been added as new claims.

II. Remarks Regarding the 35 U.S.C. § 103(a) Rejection in the First Office Action, Mailed January 11, 2005

A. The 35 U.S.C. § 103 Rejection

In the Office Action mailed January 11, 2005, claims 1-4, 6, 7, 9-15, 17-23, 25, 26, 28-34, and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,681,287 issued to Brown *et al.* [hereinafter *Brown*] in view of U.S. Patent No. 5,522,460 issued to Shu *et al.* [hereinafter *Shu*] and U.S. Patent No. 4,476,931 issued to Boles *et al.* [hereinafter *Boles*] and U.S. Patent Application Publication 2004/0154799 issued to Powell *et al.* [hereinafter *Powell*].

Applicants respectfully submit that the claims as amended are patentable over the above cited references for the reasons set forth herein.

B. As to Applicants' Independent Claim 1: The Cited References Fail to Form a Basis for a Prima Facie Case of Obviousness, Because the Cited References, Even When Taken Together, Fail to Teach All Of The Limitations Of The Present Invention

i) None of the References Teach a "Brine Overflush Containing a Cationic Surfactant"

A prima facie case of obviousness requires a showing that all claim limitations be taught or suggested by the art. M.P.E.P. § 2143.03. Applicants respectfully submit that a prima facie case of obviousness has not been established over the above-cited references as to independent claim 1.

In particular, none of the references teach "introducing a brine overflush containing a cationic surfactant into said subterranean zone to displace the resin composition from the pore space in said subterranean zone." As the references, even when taken together,

fail to teach this aspect of Applicants' independent claim 1, the references cannot form the basis for a prima facie case of obviousness as to Applicants' independent claim 1.

Brown fails to teach using brine overflushes.

Shu fails to teach using a brine overflush with cationic surfactants. While *Shu* appears to teach using a spacer volume of water, nowhere does *Shu* appear to teach using cationic surfactants with a brine overflush. See *Shu*, col. 4., lines 32-38 (teaching the use of a spacer volume of water, which in some cases may be sea water).

Boles fails to teach using a brine overflush with cationic surfactants. While *Boles* does appear to teach brine overflushes, nowhere does *Boles* teach cationic surfactants in brine overflushes. See *Boles*, col. 2, lines 17-19 (describing the use of a brine overflush). The reference to cationic monomers in *Boles* refers to cationic monomers, which make up an amphoteric polymeric material in a well treating solution used to modify the relative permeability of a formation. See *Boles*, col. 1, lines 63-67. The brine overflush discussed in *Boles*, however, contains no teaching of cationic surfactants as in Applicants' independent claim 1.

Powell fails to teach using a brine overflush containing cationic surfactants. Whereas *Powell* appears to teach the use of a brine overflush, *Powell* does not teach brine overflushes with cationic surfactants. See *Powell*, ¶¶ 29, 42, 44, 50, 52, 66, claims 2, 11, and 18.

Thus, the cited references fail to teach brine overflushes containing cationic surfactants. As these four cited references, even when taken in combination, fail to teach this aspect of Applicants' independent claim 1, these references cannot form a basis for a prima facie case of obviousness. Accordingly, independent claim 1 should not be subject to a 35 U.S.C. § 103(a) rejection based upon these four references, even when these references are taken in combination.

Further, as provided in M.P.E.P. § 2144.03(C), a conclusion as to the supposed action of a person of ordinary skill in the art is insufficient to establish a prima facie case of obviousness. To the extent that Examiner relies on such a statement or statements to supply the necessary motivation to combine or modify the prior art references, Applicants hereby respectfully traverse the lack of such a showing and request under M.P.E.P. § 2144.03(C) that the Examiner supply an affidavit or other documentary proof establishing the prior art knowledge that would have motivated a person of ordinary skill in the art to make the specific

modification and/or combination of elements to arrive at Applicants' invention. Thus, Applicants respectfully submit that the cited references cannot form a prima facie case of obviousness as to independent claim 1.

ii) None of the References Teach Using a Brine Overflush Following Placement of a Resin with an Acid Catalyst as Set Forth in Applicants' Independent Claim 1

None of the cited references teach using a brine overflush following placement of a hardenable resin composition that comprise an acid catalyst. As none of the cited references, even when taken in combination, teach this aspect of independent claim 1, the references cannot form the basis for a prima facie case of obviousness. While the cited references, when taken in combination, appear to teach brine overflushes and the use of a resin composition, none of the references teach the placement of a resin composition comprising an acid catalyst, and then, following the placement of the acid catalyst with a brine overflush following the placement of the hardenable resin composition.

With reference to *Shu*, *Shu* teaches placement of hardenable resin composition without an acid catalyst and then, following the hardenable resin composition with a spacer fluid. Only after the use of this spacer fluid, does *Shu* teach the addition of the acid catalyst. *See Shu*, col. 3, lines 14-42 and col. 4, lines 32-46 ("After a desired spacer volume of water has been placed into the well requiring sand consolidation an acid catalyst slug is injected." *Id.* at col. 3, lines 36-38; "An acid catalyst solution is injected after placement of the resin and injection of a spacer volume of water." *Id.* at col. 4, lines 39-40). Thus, *Shu* teaches placement of a resin composition, followed by a spacer fluid, which is then followed by an acid catalyst. Applicants' present invention as to claim 1, on the other hand, requires placement of a hardenable resin composition comprising an acid catalyst, which then may be followed by a brine overflush. *See Present Application*, claim 1. Thus, the methods taught in *Shu* differ from Applicants' independent claim 1.

Thus, none of the cited references teach introducing a brine following placement of both a hardenable resin composition and an acid catalyst, which is one of the aspects of Applicants' independent claim 1. Accordingly, the cited references cannot form the basis for a prima facie case of obviousness.

C. As to Applicants' Independent Claim 1: The References Do Not Contain a Suggestion Or Motivation to Modify or Combine the References to Arrive at the Specific Combination of Elements of the Present Invention

Although Applicants believe that the reasons set forth above are fully sufficient to warrant a withdrawal of the 35 U.S.C. § 103(a) rejection as to Applicants' independent claim 1, Applicants set forth these additional reasons, which also counsel for a withdrawal of the § 103(a) rejection based on the cited references.

A prima facie case of obviousness requires a suggestion or motivation in the prior art references to make the specific combination of elements claimed by Applicants. MPEP § 2143.01 (citing *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.)). The cited prior art references contain no such motivation or suggestion to combine the elements of *Brown*, *Shu*, *Boles*, and *Powell* to arrive at the specific combination of elements claimed by Applicants.

The nature of the problems to be solved by *Powell* and *Boles* are entirely different. *Powell's* use of brine flushes is directed to placement of scale inhibitors. *Boles*, on the other hand, is directed to reducing water production through the use of relative permeability modifier well treatments, a use entirely different than that of *Powell*. As the nature of the problem to be solved by each of these references are entirely different, it would not have been obvious to a person of ordinary skill to combine these references.

Additionally, the problem to be solved by the present application is entirely different than that of both *Powell* and *Boles*. The present application is directed towards reduction of fines migration, in part, through consolidation of portions of subterranean formations. Applicants' present invention uses a brine overflush to remove hardenable resin composition from the pore spaces of the formation to restore permeability. *See Present Application*, ¶ 20. Further, unlike *Powell* and *Boles*, the brine overflush of the present invention contains a cationic surfactant, which functions to water-wet the surfaces in the pore spaces of the formation. *See Present Application*, ¶ 12.

Thus, Applicants respectfully submit that combining *Boles* and *Powell* is an inappropriate combination of references. Further, the references contain no suggestion or

motivation to combine or to modify the references to arrive at the specific combination of elements of the present invention.

Thus, for at least these reasons, Applicants respectfully submit that the cited references do not support a prima facie case of obviousness against independent claim 1 of the present application.

D. As to Independent Claim 20, the Cited References Fail to Form a Basis for a Prima Facie Case of Obviousness, Because the Cited References, Even When Taken Together, Fail to Teach All of the Limitations of the Present Invention

i) None of the References Teach a “Fracturing said Subterranean Zone and Placing Particulate Proppant Material Therein to Provide Flow Channels Through said Consolidated Mass”

A prima facie case of obviousness requires a showing that all claim limitations be taught or suggested by the art. M.P.E.P. § 2143.03. None of the cited references teach fracturing said subterranean zone, nor do they teach placing particulate proppant material therein to provide flow channels through said consolidated mass. As the cited references do not teach this aspect of Applicants’ independent claim 20, the cited references cannot form the basis for a prima facie case of obviousness.

Applicants note that *Boles* mentions fracturing only in the context of *avoiding* fracturing. See e.g., *Boles*, Abstract and col. 1, lines 59-62. That is, *Boles* uses a treating solution that is injected at pumping rates and pressures “which do not exceed the fracturing gradient of the formation.” *Id.* Thus, *Boles* does not teach the step of fracturing a subterranean zone nor does *Boles* teach the step of placing particulate proppant material. Applicants note that *Brown*, *Powell*, and *Shu* appear to omit any teaching of the step of fracturing in their entirety.

Thus, the cited references, even when taken in combination, fail to teach at least one aspect of independent claim 20. Therefore, the cited references are incapable of forming a prima facie case of obviousness against independent claim 20. Accordingly, Applicants respectfully submit that independent claim 20 is patentable over the cited references.

ii) None of the References Teach Circulating a Clean-Up Brine After Introduction a Hardenable Resin Composition

Independent claim 20 of the present application reads, in part, as follows:

(b) introducing a hardenable resin composition into said subterranean zone around and adjacent to said well bore, said hardenable resin composition comprising a furan liquid resin

mixture, a solvent, an organosilane coupling agent and an acid catalyst;

(c) circulating a clean-up brine in said well bore penetrating said subterranean zone to remove said hardenable resin composition therefrom without significantly disturbing said hardenable resin composition in said subterranean zone;

See Present Application, claim 20. Step (c) occurs, at least in part, after step (b). This sequence is inherently required by the wording of claim 20, because step (c) refers to removing said hardenable resin. The hardenable resin could not be present in step (c) unless step (b) had already been at least partially performed. Thus, the wording of claim 20 inherently requires that step (c) follows step (b). None of the cited references teach this sequence limitation, that is, the limitation that a clean-up brine follows the introduction of a hardenable resin composition. As none of the cited references, even when taken in combination, fail to teach this limitation, the cited references cannot form the basis for a prima facie case of obviousness. Thus, Applicants respectfully submit that independent claim 20 is not obvious over the cited references.

E. Remaining Dependent Claims of the Present Invention

All of the remaining dependent claims in the present application depend either directly or indirectly from either independent claim 1 or independent claim 20. As the cited references cannot form a prima facie case of obviousness against these independent claims, Applicants respectfully submit that the cited references cannot form a prima facie case of obviousness against the remaining dependent claims.

SUMMARY

In light of the above remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Should the Examiner have any questions, comments, or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants have included the proper fee for the RCE. Applicants believe that no additional fees are due in association with the filing of this Response. However, should the Commissioner deem that any fees are due, including any fees for extensions of time, the Commissioner is authorized to debit the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300, for any underpayment of fees that may be due in association with this filing.

Respectfully submitted,



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